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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,000	01/17/2007	Hiroyuki Kanbara	36856.1455	1561

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EXAMINER
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EOFF, ANCA

ART UNIT	PAPER NUMBER
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1795

NOTIFICATION DATE	DELIVERY MODE
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07/14/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/596,000	<b>Applicant(s)</b> KANBARA ET AL.	
	<b>Examiner</b> ANCA EOFF	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 March 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 20, 22-29, 31 and 33-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 20, 22-29, 31 and 33-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Claims 20, 22-29, 31 and 32-36 are pending in the application. Claims 1-19, 21, 30 and 32 are canceled.
2. The foreign priority document JP 2003-393551 filed on November 25, 2003 was received and acknowledged. However, in order to benefit of the earlier filing date, a certified English translation is required.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 20, 22-25, 27, 29, 31 and 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshio et al. (US Pg-Pub 2002/0164542).

With regard to claims 20 and 31, Oshio et al. disclose a photosensitive paste comprising a water-soluble cellulose derivative (A), photopolymerizable monomer (B), an acrylic resin (C), a photopolymerization initiator (D) and an inorganic powder (abstract), wherein the powder may be powdered metal, such as iron, nickel, palladium, tungsten, copper, aluminum, silver, gold and platinum (par.0022).

The powdered metal of Oshio et al. is equivalent to the electrically conductive powder of the instant application, as defined on page 17 of the specification.

The photosensitive paste may comprise 10-50 parts by weight of the water-soluble cellulose derivative (A) and 50-90 parts by weight of the photopolymerizable monomer (B) per 100 parts by weight of the total components (A) and (B) (par.0013).

Oshio et al. teach that an amount of monomer (B) of less than 50 parts may lead to insufficient photopolymerization of the composition so the image area dissolves in the developing solution and causes failure of image formation. If the component (B) exceeds 90 parts, fine line resolution reduces (par.0013).

The photosensitive paste may comprise 10 to 50 parts of acrylic resin (C) per 100 parts by weight of the total components (A) and (C). A proportion of component (C) of less than 10 parts is insufficient for development resistance, leading to failure of image formation and if the proportion of component (C) exceeds 50 parts, developability reduces and causes some parts of the non-exposed area to remain on the substrate (par.0014).

These teachings show that the amounts of monomer (B) and acrylic resin (C) are result-effective variables, with influence over the photopolymerization of the paste and image formation, developability and line resolution. Therefore, the amounts of monomer (B) and acrylic resin (C) are optimizable.

A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) (The claimed wastewater treatment device had a tank volume to contractor area of 0.12 gal./sq. ft. The prior art did not recognize that treatment capacity is a function of the tank volume to contractor ratio, and therefore the parameter optimized was not recognized in the art to be a result-effective variable.).

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See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (prior art suggested proportional balancing to achieve desired results in the formation of an alloy). (MPEP 2144.05-II.B).

It would have been obvious to one of ordinary skill in the art at the time of the invention to optimize the content of photopolymerizable monomer (B) and acrylic resin (C) in the composition of the photosensitive paste, in order to ensure sufficient photopolymerization of the paste, development resistance while maintaining the developability and the fine line resolution (par.0013-0014).

A composition comprising 10 parts by weight of acrylic resin (C), 10 parts by weight of water-soluble cellulose derivative (A) and 90 parts by weight of monomer (B) meets the limitation of the instant application with  $\text{monomer (B)} / (\text{monomer (B)} + \text{acrylic resin (C)}) = 0.90$ .

Oshio et al. disclose that the photopolymerization initiator (D) is comprised in an amount of 0.1 to 10 per 100 parts by weight of the total of components (A) and (B). If the amount of initiator is less than 0.1 part, the composition has reduced curability and when it is more than 10 parts, the absorption by initiator tends to cause undercure in the vicinity of the substrate (par.0016). Therefore, one of ordinary skill in the art would have the motivation to optimize the amount of photoinitiator in the photosensitive paste of Oshio et al., in order to ensure the curability and without causing undercure in the vicinity of the substrate.

Oshio et al. further disclose that the photosensitive paste preferably comprises 65 to 90 parts by weight of the inorganic powder and 10 to 35 parts by weight of the organic component comprising the elements (A)-(D) (par.0026).

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A paste comprising 65-90 parts by weight of inorganic powder and 10-35 parts by weight of an organic component including 10 parts by weight of acrylic resin (C), 10 parts by weight of water-soluble cellulose derivative (A) and 90 parts by weight of monomer (B) and photoinitiator (D) in a range between 0.09-9 parts by weight is equivalent to the paste of the instant application comprising:

- 65-90 parts by weight of the inorganic powder;
- 9-30 parts by weight of monomer (B), and
- 0.009-3 parts by weight of the photopolymerization initiator (D).

Oshi et al. further disclose a pattern formation process comprising the steps of:

- forming a layer of photosensitive paste on a substrate;
- exposing to radiation;
- developing with an alkaline developer or water to remove the unexposed area

(par.0030).

With regard to claims 22 and 33, Oshio et al. further disclose that the photopolymerization type photosensitive paste may comprise monomers having a double bond concentration within the range of about 8 mmol/g to about 11 mmol/g, such as dipentaerythritol hexaacrylate (par.0009).

With regard to claims 23 and 34, Oshio et al. further disclose that the photopolymerization type photosensitive paste may comprise monomers having an ethylene oxide structure with a degree of polymerization of about 3 or less, such as ethyleneglycol diacrylate (par.0009).

With regard to claims 24 and 35, Oshio et al. further disclose that the photosensitive paste may comprise ultraviolet absorbers (par.0017).

With regard to claims 25 and 36, Oshio et al. teach that the solvent should preferably be 10-70 parts by weight per 100 parts by weight of organic component and inorganic powder (par.0028). This range does not include the range of the instant application of 5 percent by weight or less solvent.

Oshio et al. also teach that the amount of solvent added to the paste should maintain the paste in a suitable viscosity range (par.0028).

This shows that the amount of solvent added to the paste is a result-effective variable, changing the viscosity of the paste. Therefore, the amount of solvent in the paste is optimizable (MPEP 2144.05-II.B).

It would have been obvious to one of ordinary skill in the art at the time of the invention at the time of the invention to optimize the amount of solvent in the paste, in order to obtain the desired viscosity of the paste.

With regard to claim 27, Oshio et al. teach the exposure with ultraviolet radiation, excimer laser radiation, X-rays or electron beam through a mask (par.0030). It is the examiner's position that the exposure step does not involve any contacting of the paste with the mask.

With regard to claim 29, Oshio et al. further disclose that the relief pattern formed after development may be baked (par.0030), wherein the baking is performed at 400 to 600°C (par.0032).

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5. Claim 28 is are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshio et al. (US Pg-Pub 2002/0164542) in view of Iguchi et al. (US Patent 6,197,480).

With regard to claim 28, Oshio et al. teach the process of claim 20 (see paragraph 4 above) and further teach that the paste is used for obtaining plasma display panels (par.0002).

Oshio et al. teach that the paste is exposed with ultraviolet radiation through a mask (par.0030) but fail to disclose that the exposure may be performed without using a photomask.

Iguchi et al. disclose a photosensitive paste including inorganic particles and organic components and a method of producing a plasma display using said composition (abstract)

The process of Iguchi et al. comprises the following steps:

- applying the paste to a film (column 12, line 37);
- exposing the paste, preferably with UV light (column 12, lines 45-62);

Iguchi et al. disclose direct pattern formation by means of a red or blue visible laser beam or Ar ion laser beam may be performed instead of using the mask (column 12, lines 51-53).

- developing the making use of the difference in solubility to developing solution between the exposed and the unexposed portions (column 13, lines 25-27);
- firing the pattern (column 13, line 55).

Due to the fact that the patterning process of Oshio and Iguchi are directed to a photosensitive paste and are used for producing plasma display devices/panels, it



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would have been obvious to one of ordinary skill in the art at the time of the invention to perform the exposure step of the process of Oshio by direct pattern formation as disclosed by Iguchi et al.

The direct pattern formation step of Oshio modified by Iguchi is equivalent to the step of exposure without a mask of the instant application.

### ***Allowable Subject Matter***

6. Claim 26 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Oshio et al. teach that the paste is aqueous or alkaline-developable (par.0004).

Oshio et al. further teach that the development with organic solvents uses expensive organic solvents, leads to increase of production cost, gives rise to environmental pollution and harm to human bodies (par.0002).

Therefore, one of ordinary skill in the art would not be motivated to use an organic solvent for the development of the paste of Oshio et al.

### ***Response to Arguments***

7. With regard to the applicant's arguments on pages 1-5 of the Remarks filed on March 31, 2009, the examiner would like to note the following:

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- the rejection of claims 20, 22-24, 26-27, 29, 31 and 33-35 under 35 U.S.C. 103(a) over Park et al. (US Pg-Pub 2002/0160313) in view of Frechet et al. (US Patent 5,648,196) is withdrawn following the applicant's amendment to claims 20 and 31;

- the rejection of claims 25 and 36 under 35 U.S.C. 103(a) over Park et al. (US Pg-Pub 2002/0160313) in view of Frechet et al. (US Patent 5,648,196) as applied to claims 20 and 31 and in further view of Crary (US Patent 3,661,576) is withdrawn following the applicant's amendment to claims 20 and 31, and

- the rejection of claim 28 under 35 U.S.C. 103(a) over Park et al. (US Pg-Pub 2002/0160313) in view of Frechet et al. (US Patent 5,648,196) as applied to claim 20 and in further view of Iguchi et al. (US Patent 6,197,480) is withdrawn following the applicant's amendment to claim 20.

8. Applicant's arguments regarding the rejection of claims 20, 22-24, 29, 31 and 33-35 under 35 USC 103(a) over Oshio et al. (US Pg-Pub 2002/0164542) have been fully considered but they are not persuasive.

On pages 3-4 of the Remarks, the applicant argues that Oshio et al. teach an inorganic powder for an insulating paste, wherein the powder include some small amount of powdered metal. The applicant further argues that the powder of Oshio et al. cannot include a conductive powder that is about 60-90% by weight of the insulating paste because, if the conductive powder were included within this range, then the paste of Oshio et al. would no longer be suitable for providing insulation but it would be conductive.

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The examiner respectfully disagrees and would like to show that there is no teaching in Oshio et al. that the “powder include some small amount of powdered metal”.. Paragraph 0022 of Oshio et al. teach “The inorganic powder which can be used in the present invention is not particularly limited as long as it is transparent to light used for exposure” and further includes “powdered metals, such as iron, nickel, tungsten, copper, palladium, aluminum, silver, gold and platinum” as the inorganic powder.

The powdered metals are equivalent to the electrically conductive powder of the instant application, as taught at the bottom of page 17 of the specification.

Also, Oshio et al. teach in par.0026 that the paste composition should comprise between 65 to 90 parts by weight of the inorganic powder per 100 parts of the total composition.

There are no limitations regarding the amounts of metal powder used in the composition.

The only limitations are concerning the transparency of the composition, such as the teachings in par.0022 : ““The inorganic powder which can be used in the present invention is not particularly limited as long as it is transparent to light used for exposure” and “It is desirable that the inorganic powder be free of silicon oxide, aluminum oxide or titanium oxide. Presence of these impurities reduces light transmittance.”

As Oshio et al. clearly teach that powdered metals such as iron, nickel, tungsten, copper, palladium, aluminum, silver, gold and platinum as the inorganic powder (par.0022) and further teach that the paste composition should comprise between 65 to

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90 parts by weight of the inorganic powder per 100 parts of the total composition (par.0026), it would have been obvious to one of ordinary skill in the art to obtain a paste composition comprising between 65-90 parts by weight of a powdered metal.

The paste of Oshio et al. is equivalent to the photosensitive paste of the instant application.

### ***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANCA EOFF whose telephone number is (571)272-

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9810. The examiner can normally be reached on Monday-Friday, 6:30 AM-4:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. E./

Examiner, Art Unit 1795

/Cynthia H Kelly/

Supervisory Patent Examiner, Art Unit 1795